



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/609,203	06/26/2003	Tan Tzyy Haw	42P16893	7332

7590 04/26/2005

Blakely, Sokoloff, Taylor & Zafman
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025-1030

EXAMINER

STONER, KILEY SHAWN

ART UNIT	PAPER NUMBER
----------	--------------

1725

DATE MAILED: 04/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/609,203

Applicant(s)

HAW ET AL.

Examiner

Kiley Stoner

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-18 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I (claims 1-18) in the reply filed on 3-21-05 is acknowledged. The applicant canceled the non-elected claims 19-29, reserving the right to file a divisional application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8, 12, 14 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 8 and 14 contain the trademark/trade name Asymtek Dispenser System and ITW Dynamelt. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade

Art Unit: 1725

name is used to identify/describe a hot melting jig and dispenser and, accordingly, the identification/description is indefinite.

In claims 12 and 16 the applicant claims "placing surface mount technology (SMT) on the BGA package using the solder paste; solder reflowing; solder waving; and processing backend". It is unclear from this language whether the claim requires all of the above steps or just one.

If this language intends to require all of the processing steps.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 12 and 16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The disclosure does not enable one of ordinary skill in the art to use solder paste; solder reflowing; solder waving; and processing backend methods in combination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 7, 11-12, 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh (6,564,986) in view of Stewart et al. (US-2003/0170450). Hsieh teaches determining an area of weakness in a ball grid array (BGA) package having an array of solder balls; an integrated circuit (IC) device; a first surface coupled with the IC device; a printed circuit board (PCB) having a second surface, the second surface aligned with the first surface using the array of solder balls, wherein the array of solder balls placed in between the first surface and the second surface; and solder joints to attach the array of solder balls with the first surface and the second surface (abstract; column 2, lines 53-64 and Figures); the area of weakness comprises at least one of the following: edges, corners, and perimeter of the BGA package (Figure 3C and column 2, lines 53-64); determining an area of weakness in a ball grid array, (BGA) package (abstract; column 2, lines 53-64 and Figures); determining an area of weakness in a ball grid array (BGA) package (abstract; column 2, lines 53-64 and Figures).

Hsieh fails to teach applying a bonder to the area of weakness in the BGA package, wherein the bonder is applied independently of the array of solder balls; the applying of the bonder comprises applying the bonder between the first surface and the second surface to provide resistance to the BGA package against warpage; the warpage comprises at least one of the following: opening, cracking, curving, bending, and breaking of the second surface; the bonder comprises at least one of the following: a thermoplastic bonder and a silicon bonder; applying a thermoplastic bonder to the area of weakness between a first surface and a second surface in the BGA package; printing solder paste to create a BGA package; placing surface mount technology (SMT) on the BGA package using the solder paste; solder reflowing; solder waving; and processing backend; applying a silicon bonder to the area of weakness between a first surface and a second surface in the BGA package; applying the silicon bonder prior to solder reflowing.

Stewart et al. teaches applying a bonder to the area of weakness in the BGA package, wherein the bonder is applied independently of the array of solder balls (paragraphs [0081], [0109]-[0111] and [0114]); the bonder comprises at least one of the following: a thermoplastic bonder and a silicon bonder (paragraphs [0058], [0077], [0081], [0109]-[0111] and [0114]); applying a thermoplastic bonder to the area of weakness between a first surface and a second surface in the BGA package (paragraphs [0081], [0109]-[0111] and [0114]); applying a silicon bonder to the area of weakness between a first surface and a second surface in the BGA package (paragraphs [0058], [0077], [0081], [0109]-[0111] and [0114]); applying the silicon

Art Unit: 1725

bonder prior to solder reflowing (paragraphs [0058], [0077], [0081], [0109]-[0111] and [0114])

With respect to claims 3-4, the adhesive of Stewart et al. would prevent warpage.

With respect to claim 12, if the language intends to require only one of the processing steps, Stewart et al. teaches printing solder paste to create a BGA package; placing surface mount technology (SMT) on the BGA package using the a process selected from the group comprising solder paste; solder reflowing; solder waving; and processing backend (paragraphs [0081], [0109]-[0111] and [0114]).

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the bonder application of Stewart et al. with the defect determining method of Hsieh in order to reinforce a solder ball bond with an adhesive bond when repairing a BGA.

Claims 6, 8-10, 14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh (6,564,986) and Stewart et al. (US-2003/0170450) as applied to claims 1 and 11 above, and further in view of Austin et al. (6,284,173). Hsieh and Stewart et al. teach all of the limitations of the claims except applying the bonder using a bonder dispenser; the applying of the bonder comprises applying the thermoplastic bonder using a hot melting jig or a dispenser; the applying of the bonder comprises applying the silicon bonder using an epoxy dispenser machine; the independent application of the bonder is performed using software to control placement distance of the bonder with respect to the array of solder balls.

Austin et al. teaches applying the bonder using a bonder dispenser; the applying of the bonder comprises applying the thermoplastic bonder using a hot melting jig or a dispenser; the applying of the bonder comprises applying the silicon bonder using an epoxy dispenser machine; the independent application of the bonder is performed using software to control placement distance of the bonder with respect to the array of solder balls (abstract; column 3, lines 38-62; column 4, lines 29-46; and column 7, lines 41-53).

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the encapsulant dispenser of Austin et al. with the determining method of Hsieh and the bonding method of Stewart et al. in order to precisely position the encapsulant when repairing a BGA.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh (6,564,986) and Stewart et al. (US-2003/0170450) as applied to claim 11 above, and further in view of Longgood et al. (6,045,032). Hsieh and Stewart et al. fail to teach that the thermoplastic bonder is applied after solder waving, however, Stewart et al. teaches applying thermoplastic adhesive after the application of solder paste to the components being bonded (paragraphs [0081], [0083], [0109]-[0111] and [0114]).

Longgood et al. teaches applying solder material to a BGA by solder waving (abstract; Figures, column 1, line 34-column 2, line 19; and column 3, line 31-column 4, line 67). At the time of the invention it would have been obvious to one of ordinary skill in the art to substitute the solder application method of Longgood et al. for the solder

Art Unit: 1725

application method of Stewart et al. and Hsieh in order to pretin the circuit board without a subsequent heating operation to melt the solder paste of Stewart et al.

Conclusion

The prior art of record that is cited as of interest is presented on the form-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiley Stoner whose telephone number is (571) 272-1183. The examiner can normally be reached on Monday-Thursday (7:30 a.m. to 6:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on Monday-Friday at (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KILEY S. STONER
PRIMARY EXAMINER

Kiley Stoner 4/21/05